

Seismic Facies using Supervised Waveform Classification

information an attempt can be made for reduction of unknown variables and thus reducing uncertainties.

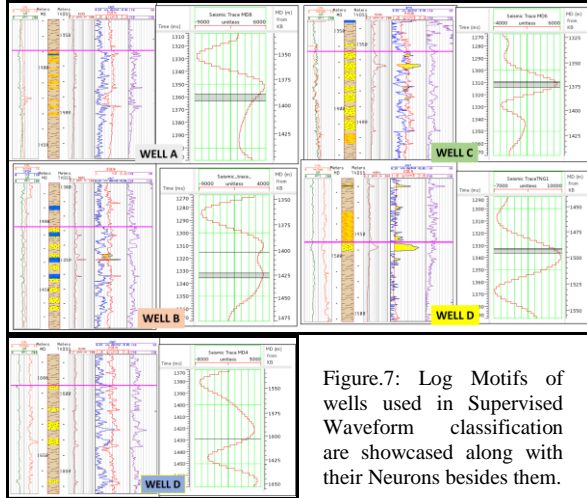


Figure.7: Log Motifs of wells used in Supervised Waveform classification are showcased along with their Neurons besides them.

Results and discussion

Analysis of Seismic Facies map, tells us that the areas corresponding to yellow and light brown class are of prominence (Figure.8a) The zones encircled in dotted red color are interesting and can be taken up for analyzing the extension of Kamalapuram play. However, considering the nature of this play being of strati-structural type, the areas highlighted in black circle would be highly risky for venturing into further exploration (despite being in good class) from structural point of view (Figure.8c). The maps generated can be utilized with great reliability, as the correlation map (Figure.8b) shows a confidence greater than 75% (Sky blue area) in majority of our area. The results of this map were vindicated by occurrence of good hydrocarbon (Gas) shows & facies in recently drilled well G, which would be tested in future. The RMS amplitude attribute map (Figure.8d) generated in the same window (64ms) along the horizon shows several high amplitude discrete pockets. From conventional amplitude Interpretation point of view, these areas tend to be interesting. But from our analysis, we can say that all these high amplitude bodies are not always prospective. Additionally, RMS amplitudes easily get masked by higher values generated due to response of higher degree of calcareous content.

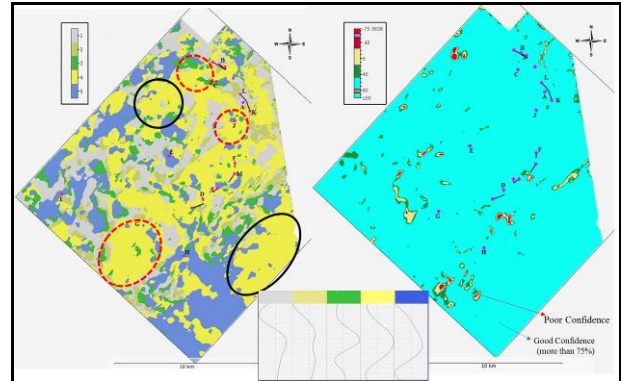


Figure.8(a, b): Seismic Waveform Classification(left) and Facies correlation confidence map(right).

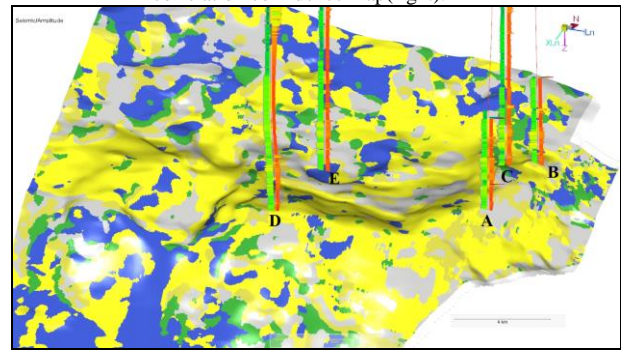


Figure.8c: Perspective View of showing Facies of class 3&4 lying along the crustal high have a higher probability of success

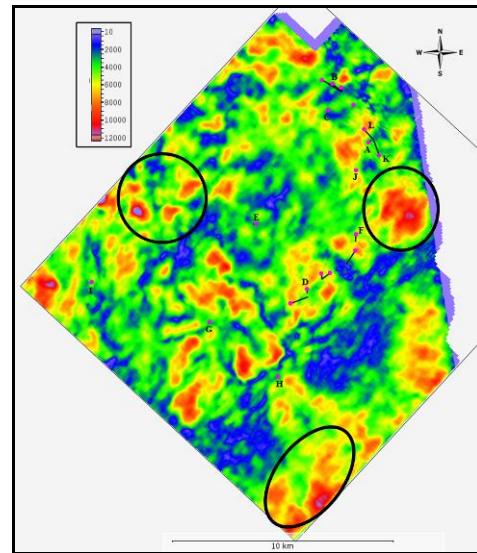


Figure.8d: RMS amplitude map of Kamalapuram formation (window: 64ms)

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The areas encircled in black on the map are rendered to be of poor Seismic Facies (Silty calcareous nature) by results of Waveform Classification. Hence, RMS attribute has limitations in our area, as it only focusses on a single dimension of a trace i.e. amplitude.

Displaying of Seismic Facies on seismic section helps us to visualize the variation along with correlation confidence. (Figure.9) It can be used for critically analyzing the facies based on correlation confidence near fault zones, during placing of wells.

Conclusions

Changes in Seismic Waveform are attributed to changes in lithology, porosity & pore fluids. Prospective zones for exploitation of Kamalapuram play of Eocene age have been identified through the application of current study. The results were validated by occurrence of gas shows & sandy facies in recently drilled well. Seismic Facies map generated, have provided a greater objectivity and helps us to identify the areas with similar rock property precisely.

References

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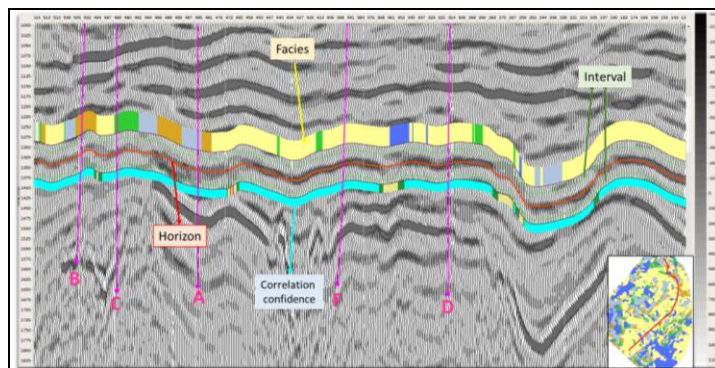


Figure.9: Seismic Section depicting Waveform classes, horizon (red), interval (green) and correlation confidence

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